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**The Effects of Prison Sentences
on Recidivism¹**

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Executive Summary

The use of prisons to control crime has increased in frequency in the last decade. Most recently, mandatory minimum sentencing policies have gained widespread popularity throughout the United States, severely limiting judicial discretion in sentencing. The principle rationale for mandatory minimums is the belief that length of time in prison acts as a deterrent to future recidivism.

Three schools of thought dominate the area. The first is that prisons definitely suppress criminal behaviour. Given the unpleasantness of prison life and the negative social stigma associated with incarceration, these should serve as deterrents to later criminal behaviour. The second, the "schools of crime" viewpoint, proposes just the opposite, that is, that prisons increase criminality. By this account, the barren, inhumane, and psychologically destructive nature of prisonisation makes offenders more likely to recidivate upon release. The third school of thought, which we label the "minimalist/interaction" position, contends that the effect of prison on offenders is, for the most part, minimal. This view states that prisons are essentially "psychological deep freezes", in that offenders enter prison with a set of antisocial attitudes and behaviours which are little changed during incarceration. This perspective also suggests that lower risk offenders may be more adversely affected by greater lengths of incarceration through exposure to an environment typically dominated by their higher risk, more hard core peers.

Fifty studies dating from 1958 involving 336,052 offenders produced 325 correlations between recidivism and (a) length of time in prison and recidivism or (b) serving a prison sentence vs. receiving a community-based sanction. The data was analysed using quantitative methods (i.e., meta-analysis) to determine whether prison reduced criminal behaviour or recidivism.

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The results were as follows: under both of the above conditions, prison produced slight increases in recidivism. Secondly, there was some tendency for lower risk offenders to be more negatively affected by the prison experience.

The essential conclusions reached from this study were:

1. Prisons should not be used with the expectation of reducing criminal behaviour.
2. On the basis of the present results, excessive use of incarceration has enormous cost implications.
3. In order to determine who is being adversely affected by prison, it is incumbent upon prison officials to implement repeated, comprehensive assessments of offenders' attitudes, values, and behaviours while incarcerated.
4. The primary justification of prison should be to incapacitate offenders (particularly, those of a chronic, higher risk nature) for reasonable periods and to exact retribution.

Introduction

The application of sanctions by the legal system has been at the forefront of society's efforts to control criminal behaviour. The most recent trend, especially in the U.S., has been to use prison sentences, particularly what are known as mandatory sentences, to achieve this goal. Mandatory sentences are grid-like sentencing prescriptions that attempt to make the "punishment" fit the crime. Judicial discretion is severely limited as regards weighting of individual circumstances in sentencing. Almost all U.S. states and the federal government have some sort of mandatory laws, wherein drug crimes have figured prominently.

California has been a leader in this area as the proponent of one of the broadest, toughest and most rigorously applied mandatory minimum policies, commonly known as the "three strikes and out" law (Stolzenberg & D'Alessio, 1997). The state provides a mandatory sentence of 25 years to life for a third felony and there is no distinction among types of felonies. To illustrate how harsh mandatory sentences can be, consider one Greg Taylor (Bellisle, 1999), whose first two crimes (or strikes) were stealing \$10.00 and a bus pass, then robbing a man on the street. Fourteen years later, he was caught attempting to break into a church to steal food (his third strike). He received a sentence of 25 years to life. Even first strike sentences can be tough as evidenced by the case of a Ms. Renée Bojé who has no criminal record. Currently living in Vancouver, she is facing a minimum of 10 years in prison for watering a marijuana plant on a balcony in California should she return to the U.S. (Anderssen, 1999).

A major justification² of mandatory prison sentences is that they will teach offenders that punishment is certain and severe, and thus that "crime does not pay". In other words, this policy is largely based upon the assumption that certain prison terms specifically deter offenders. In this light, the current paper empirically examines the specific deterrence hypothesis. Our primary concern is with offenders whose criminal history or offense type is serious enough to

warrant imprisonment. The schools of thought on the validity of the specific deterrence hypothesis as it relates to the use of prison are reviewed. Then, we present new evidence that directly tests the notion that prison sentences punish or deter future offending.

Before proceeding, it is important to clarify what is meant by punishment. While the terms "deterrence" and "punishment" are often used interchangeably, our preference is to use the behavioural definition of "punishment": the suppression of behaviour by response-dependent events (Blackman, 1995). Note that this definition is purely functional. It avoids common sense interpretations of what constitutes punishment, which are often based on gut-level and moral philosophical grounds, and may, therefore, be fallacious³ (Matson & DiLorenzo, 1984).

Effects of Imprisonment: Three Schools of Thought

There are three schools of thought regarding the ability of prisons to punish. The first is that prisons definitely suppress criminal behaviour. The second perspective, the "schools of crime" viewpoint, proposes just the opposite, that is, that prisons increase criminality. The third, which we label the "minimalist/interaction" position, contends that the effects of prison on offenders is, with few exceptions, minimal.

We review the basic assumptions of each school, present the best evidence in support of their views and provide a brief critique of the merits of their position.

Prisons as punishment

The view that the experience of prison in itself acts as a deterrent is rooted in the simple specific deterrence theory (Andenaes, 1968) which predicts that individuals experiencing a more severe sanction are more likely to reduce their criminal activities in the future. Economists have taken the lead in support of the specific deterrence model (see von Hirsch, Bottoms, Burney, & Wikström, 1999). They maintain that incarceration imposes direct and indirect costs on inmates

(e.g., loss of income, stigmatization) (Nagin, 1998; Orsagh & Chen, 1988; Pyle, 1995; Wood & Grasmick, 1999). Thus, faced with the prospect of going to prison or after having experienced prison life, the rational individual would choose not to engage in further criminal activities. In addition, another "cost" argument, identical to that which the "schools of crime" advocates employ (see next section), is that, if prison life is a degrading, dehumanizing experience then it surely must be regarded as an additional "psychological" cost of doing time.

Surveys indicate that both the public and offenders consider prison to be the most severe or effective punisher of criminal behaviour (Doob, Sprott, Marinos, & Varma, 1998; Spelman, 1995; van Voorhis, Browning, Simon, & Gordon, 1997).⁴ Policy makers often assume that prison is the severest punishment available (Wood & Grasmick, 1999). DeJong (1997) remarked that the expectations of the public and policy-makers are that incarceration has powerful deterrent effects.

What kind of data is used to support the prison as punishment hypothesis? The most persuasive evidence comes from some ecological studies where the results are based on rates or averages (aggregate data). An example of one of the most positive results came from a study by Fabelo (1995) that reported a 30% increase in incarceration rates across 50 U.S. states, corresponding with a decrease of 5% in the crime rate for a five-year period.⁵ Fabelo's data has been interpreted as convincing evidence that prisons punish (Reynolds, 1996).

Some caveats about the potency of the prisons as punishers should be noted. Not all researchers view the ecological evidence regarding prisons as convincing (Gendreau & Ross, 1981; von Hirsch et al., 1999). It must be emphasized that ecological studies, based as they are on aggregate data, may say absolutely nothing about individual behaviour (Andrews & Bonta, 1994; Menzel, 1950; Robinson, 1950). Furthermore, the effects found in aggregate studies, which are expressed in correlational terms, are almost invariably wildly inflated⁶ when compared to individual level results (Freedman, Pisani, Purves, & Adhikari, 1991; Robinson, 1950; Zajonc, 1962; Zajonc & Mullaney, 1997). Causality, moreover, cannot be inferred as a host of other

underlying factors (e.g., economy, demographics, incapacitation policies, etc.) - Henshel (1978) listed 15 such factors - that may influence the prison sanction-crime rate relationship (see also Gendreau & Ross, 1981; von Hirsch et al., 1999).

In addition, Nagin (1998), who feels strongly that the deterrence literature in general is persuasive, despairs that if the rate of imprisonment keeps climbing, prisons will be seen as less stigmatizing thereby neutralizing any possible deterrence effect. Others suggest that only some classes of offenders may be deterrable, such as those who are more strongly bonded to society (i.e., at lower risk) (see DeJong, 1997). Orsagh and Chen (1988) have posited a U-shaped threshold theory for the punishing event, by which a "moderate" dosage of prison would be optimal. And, there is the current view that the modern prison is too comfortable; only "no-frills" prisons offer enough punishment to act as an effective deterrent (Corcoran, 1993; Johnson, Bennett, and Flanagan, 1997). As in days gone by, prisons should be places of only bare bones necessities,⁷ where life is lived in fear (e.g., caning is appropriate) (Nossiter, 1994).

Schools of crime

The belief that prisons are "schools of crime" also has widespread support. The earliest writings on crime by scholars such as Bentham, De Beaumont and de Tocqueville, Lombroso and Shaw, suggested that prisons were breeding grounds for crime (see Lilly, Cullen, & Ball, 1995). Jaman, Dickover, and Bennett (1972) put the matter succinctly by stating that "the inmate who has served a longer amount of time, becoming more prisonised in the process, has had his tendencies toward criminality strengthened and is therefore more likely to recidivate than the inmate who has served a lesser amount of time" (p. 7). This viewpoint is widely held today by many criminal justice professionals and policy makers (see Cayley, 1998; Latessa & Allen, 1999; J. Miller, 1998; Schlosser, 1998; Walker, 1987), some politicians (e.g., Clark, 1970; Rangel, 1999, who said that prisons granted Ph.D.s in criminality), and segments of the public (Cullen, Fisher, & Applegate, in press). Aspects of our popular culture (e.g., cinema) also

reinforce the notion that prisons are mechanistic, brutal environments that likely increase criminality (Mason, 1998).

How might prisons enhance criminality? There is a large body of literature of primarily an anecdotal, qualitative, and phenomenological nature, which asserts that the prisonisation process destroys the psychological and emotional well-being of inmates (see Bonta & Gendreau, 1990; Cohen & Taylor, 1972). In contrast to the prisons as punishment view, "schools of crime" advocates view the glass as half-full rather than half-empty. By their reasoning, if prison psychologically destroys the inhabitants, then their adjustment to society upon release can only be negative, with one likely consequence being a return to crime.

A more precise specification of the mechanisms involved comes from behavioural analysts. These researchers pay less heed to putative psychologically destructive features of the prison environment, rather, they focus simply on which beliefs and behaviours are reinforced or punished therein. Bukstel and Kilmann's (1980) classic review of the effects of prison literature summarized several studies (e.g., Buehler, Patterson, & Furniss, 1966) that employed behavioural technologies to examine and record in detail the social learning contingencies that existed in various prisons. Bukstel and Kilmann (1980, p. 472) claimed that each study found "overwhelming positive reinforcement" by the peer group for a variety of antisocial behaviours, so much so, that even staff interacted with the inmates in a way that promoted a procriminal environment. As with the phenomenological literature, the inference here is that prisons should promote criminality.⁸

Although the literature remains sparse, studies do exist which have correlated the psychological changes offenders undergo in prison with their recidivism upon release. Importantly, the findings from this research are not consistent with the "schools of crime" position (see Gendreau, Grant, & Leipziger, 1979; Wormith, 1984; Zamble & Porporino, 1990). Many of the coping behaviours or psychological changes seen among prisoners are not predictive of recidivism, and only a few are correlated with changes in recidivism.

Minimalist/interaction school

Different frames of reference have contributed to this perspective. The first three coalesce nicely to provide compelling reasons why prisons should have no appreciable effect on recidivism. There is the human and animal experimental learning and behaviour modification literatures (see Gendreau, 1996). Coupled with the social psychology of persuasion knowledge base, they provide ample evidence to refute the notion that it is an easy matter to coerce offenders. Furthermore, the offender personality literature attests to the fact that the makeup of offenders is a complicating factor. We address each in turn.

Firstly, there has been a tremendous amount of research on which punishing events are the most effective in suppressing behaviour (Matson & DiLorenzo, 1984). Prison life events are not included among them. In addition, there are several absolutely crucial criteria that must always apply in order for punishment to be maximally effective (Schwartz & Robbins, 1995). Some of these are that the punishing stimuli must be immediate, as intense as possible, predictable, and the delivery of punishment serves as a signal that reinforcement is not available for the punished response. Given the nature of these strictures, it has been noted that "it is virtually impossible to meet these criteria in the real world in which offenders live unless some unbelievably efficient Orwellian environment" (Gendreau, 1996, p. 129) exists akin to a giant Skinner box. Others who have examined this issue have come to a similar conclusion (e.g., Clark, 1995; J. McGuire, 1995; Moffitt, 1983). Furthermore, and this is a critical point, punishment only trains a person what not to do. If one punishes a behaviour what is left to replace it? In the case of high-risk offenders, simply other antisocial skills! This is why punishment scholars state that the most effective way to produce behavioural change is not to suppress "bad" behaviour, but to shape "good" behavior (e.g., Blackman, 1995).

Also, the road travelled from committing a crime to incarceration is circuitous given that only a "tiny fraction" of criminal victimizations result in prison time, in most cases, months later

(Bennett, Dilulio, & Walters, 1996, p. 49). And, offenders' knowledge of sanctions, even of highly publicised ones (e.g., Bennett, et al., 1996; Jaffe, Leschied, & Farthing, 1987), is far from accurate.

Secondly, the social psychology literature on persuasion and resistance processes provides another compelling rationale as to why at least the threat of punishment, such as prison, is decidedly problematic. This is a complex literature which deserves a fuller analysis; suffice it to say, that for persuasion to occur the principle of positive reciprocity (i.e., do something nice to somebody) must apply. The source of the message must be credible, attractive, and authoritative (but not authoritarian), and the appeal of the message engineered so that commitment on the part of the receiver is achieved (Cialdini, 1993; W. J. McGuire, 1995). Once commitment has occurred, several other steps must be met in order for behaviour to change (Fishbein, 1995).⁹ Additionally, clinicians who are skilled in breaking down resistance to change express empathy, avoid argumentation, support self-efficacy, and do not excessively confront or threaten (Miller & Rollnick, 1991). To repeatedly threaten someone is to invite the well-documented process of psychological inoculation whereby individuals think of reasons to resist change (see Eagly & Chaiken, 1993). We suspect that offenders are masters of this behaviour. A study by Hart (1978) of punishment in the army is a good example of the occurrence of the inoculation principle.

Thirdly, the question must be asked as to who the criminal justice system wishes to punish. The salient beliefs and attitudes of higher risk offenders, whom one most wishes to change, are antagonistic to education, employment, and supportive interpersonal relationships. Their personalities can be highly egocentric, manipulative, and impulsive. They frequently engage in skewed decision-making processes that greatly over-estimate the benefit of antisocial actions vs. the costs involved (see Andrews & Bonta, 1998; Carroll, 1978; Gendreau, Little, & Goggin, 1996; Gendreau & Ross, 1981; Hare, 1996).¹⁰ They may often be under the influence of a substance thereby further distorting their perceptions of reality. Some would agree that the

nature of offenders is such that they may be resistant to punishment even under circumstances where optimal punishment conditions apply (see Andrews & Bonta, 1998, p. 171-173; Gendreau & Suboski, 1971).

Taken together, these three sets of literature suggest that the effects of prison are likely minimal. A closely allied view is that the effects of imprisonment are conditional, that while prisons generally have little effect on offenders, there are exceptions to the rule. Originally, researchers from this camp came into the field with the expectation that prisons were "schools of crime" only to conclude from their work and the available evidence that prisons were basically "psychological deep freezes" (Zamble & Porporino, 1988). In essence, they were stating that the behaviour seen in prison was similar to that which existed prior to incarceration. Cross-sectional and longitudinal studies of length of incarceration and differential prison living conditions have found few negative psychological results of incarceration (Bonta & Gendreau, 1990; Gendreau & Bonta, 1984); in fact, in some areas the opposite result has occurred (see Zamble, 1992, and the special edition of the Canadian Journal of Criminology, October 1984 volume 26, on the effects of incarceration). Offenders, moreover, who have been the most anti-social in prison and the most likely to recidivate upon release, have also tended to be higher risk going into prison (Gendreau, Goggin, & Law, 1997).

Despite this overall trend, these researchers left room for some interactions to occur (e.g., Bonta & Gendreau, 1990; Paulus & Dzindolet, 1993; Wright, 1991) by asking the questions what types of offenders under which prison living conditions might be adversely affected (Bonta & Gendreau, 1990, p. 366). For example, Zamble and Porporino (1990) found the higher risk incarcerates coped the least well in prison. They suggest that they could be prone to a greater degree of recidivism. On the other hand, a commonly expressed view is that it is low-risk offenders for whom prison has the greater negative impact. Leschied and Gendreau (1994) contended, on the basis of aggregate recidivism trends in Canada and a social learning model of criminal behaviour (Andrews & Bonta, 1998), that incarcerated low risk offenders should be

negatively influenced by the potent antisocial values of their higher risk peers (also see Feldman, Caplinger, & Modarsky, 1983; Leschied, Jaffe, & Austin, 1988). Higher risk offenders should be little influenced by a term of imprisonment.

In summary, the three schools of thought make different predictions about the effect of prison on recidivism. They are:

1. Prisons as punishment: prisons reduce recidivism. This effect may be moderated by individual and situational factors. Lower risk offenders may be more readily deterred and prisons with fewer "frills" (e.g., studies conducted in prisons decades earlier) might produce better results. Length of sentence may also be a factor.

2. Schools of crime: prisons increase recidivism for all offenders.

3. Minimalist/Interaction: the effect prisons have on recidivism are minimal at best; some offenders (lower or higher risk) may fare worse.

As this review has noted, however, the data in support of each school is inconclusive in that it cannot be a substitute for an analysis of the effects of prison on the recidivism of individual offenders. Fortunately, there exists a heretofore neglected literature which directly addresses the aforementioned hypotheses (Bonta & Gendreau, 1992; Levin, 1971; Song & Lieb, 1993). These authors provided narrative reviews of studies which compared the recidivism rates of offenders who were incarcerated for differing lengths of time as well as offenders incarcerated vs. those sentenced to a community sanction. The conclusions reached were tentative because of the small number of studies assessed ($\approx$ a dozen studies).¹¹

The problem with narrative reviews is that they lack precision. Conclusions are often couched in terms of imprecise qualitative (e.g., "more" or "less") judgements. They are subjective and open to bias, as evidence is sometimes used selectively to support a favoured theory or ideology (see Rosenthal, 1991). In the last decade meta-analytic techniques have supplanted the traditional narrative review as the gold standard for assessing results across studies in medicine and the social sciences in a more precise, objective fashion (Hunt, 1997).

Meta-analysis summarizes a collection of individual studies in a quantitative fashion. That is, the findings from each study are pooled and statistically analysed. The end result is a precise, quantitative summary of the magnitude of the effect within a particular body of literature. In addition, meta-analysis examines the extent to which the characteristics of combined studies (e.g., quality of research design, nature of the subjects, etc.) are related to the magnitude of the effect size.

This study, therefore, attempts to build upon previous narrative reviews by expanding the literature search¹² and employing meta-analytic techniques to determine the precise effect of prisons on recidivism.

Method¹³

Sample of Studies

A literature search for studies examining the effects of time in prison on recidivism was conducted using the ancestry approach and library abstracting services. For a study to be included, data on the offender had to be collected prior to the recording of the recidivism results. A minimum follow-up period of six months was required. The study was also required to report sufficient information to calculate a correlation between the "treatment" condition (e.g., prison vs. no prison) and recidivism. This correlation is the phi coefficient (ϕ) and is referred to as the effect size.

Coding of Studies

For each effect size the following information was recorded: geographic location of study, decade in which study was published, offender age, gender, race, risk level, risk assessment methodology, sample size, design quality, type of sanction, type of outcome, length of follow-up.

Effect Size Calculation

Phi coefficients (ϕ) were produced for all treatment - control comparisons in each study that reported a numerical relationship with recidivism. The following is an example of what the ϕ value represents in a particular case where the respective recidivism rates for a group of offenders imprisoned for 5 years vs. 3 years were 30% vs. 25% respectively. The ϕ value was .05, the exact difference between the recidivism rates of the two comparison groups. The reader will note that the ϕ value is a very practical effect size indice and easy to interpret. Unless there are extreme base rates and the sample sizes in the comparison groups vary greatly, the ϕ value represents the exact difference (or fall within 1 or 2 percentage points) in recidivism between two comparison groups (Cullen & Gendreau, in press).

In the event of non-significant predictor-criterion relationships, where a p value of greater than .05 was the only reported statistic, a ϕ of .00 was assigned.

Next, the obtained correlations were transformed into a weighted ϕ value ($z^{\pm}$) that takes into account the sample size of each effect size and the number of effect sizes per sanction. (Hedges & Olkin, 1985). The weighting was done because some would argue that more credence should be given to effect sizes with larger sample sizes. Please note that outcome was recorded such that a positive ϕ or $z^{\pm}$ is indicative of an unfavourable result (i.e., the stronger the sanction - more prison time - the higher the recidivism rate).

Effect Size Magnitude

The assessment of the magnitude of the effect of various sanctions on recidivism was conducted by examining the mean values of ϕ and $z^{\pm}$ and their respective confidence intervals (CI). The CI is the 95% probability that the interval contains the population value. If the CI does not include 0 it can be concluded that the mean effect size is significantly different from 0

(i.e., better than chance alone). If there is no overlap between the CIs, then the conditions being compared are assessed as statistically different from one another at the .05 level.

Results

Description of the Studies

More vs. Less Time in Prison

Twenty-three studies examining the effect of more vs. less time in prison met the criteria for inclusion and generated 222 effect sizes with outcome.¹⁴

All of the studies in the sample were published, either in journals, texts, or government reports. More than 90% of the effect sizes came from American studies, the majority of which were conducted during the 1970s (86%). The data set included a substantial range in the number of effect sizes reported per study ($\bar{n} = 1 - 79$) and the distribution of sample sizes across effect sizes ($\bar{n} = 19 - 1,608$).

Ninety-eight percent of effect sizes were generated from adult samples, the majority of them male (90%). Race was not specified for the majority of effect sizes (75%). Level of risk by effect size was evenly distributed between samples assessed as low (49%) versus high risk (49%). Determination of risk rarely involved the use of valid standardized psychometrics (16%). Rather, for most effect sizes, it was deduced from either the number of prior offences within the sample (47%) or the reported percentage of recidivism of the comparison group at study completion (36%).

A measure of study design quality found that just over half of the effect sizes in the more vs. less domain came from studies rated as strong in design (55%). These were studies where the more vs. less groups were similar on at least five risk factors. The period of follow-up for almost two-thirds of effect sizes was between six months and one year (64%). The most common type of outcome among this group of effect sizes was parole violation (77%).

Incarceration vs. Community-Based

A total of twenty-seven studies met the criteria for inclusion in the incarceration vs. community-based domain, reporting 103 effect sizes with recidivism. Offenders in the latter category were under various probation or parole conditions.

As with the more vs. less data set, here too all of the studies involved were published and the majority of effect sizes came from American studies (68%), while 22% were generated from studies conducted in the United Kingdom. Overall, the effect sizes herein were representative of more recently produced studies (96% published since 1980). While the number of effect sizes per study was relatively discrete ($\bar{n} = 1 - 12$), there was considerable range in sample sizes associated with effect sizes ($\bar{n} = 24 - 54,633$).

Sixty-eight percent of effect sizes were generated from adult samples, with 23% coming from juveniles. Regardless of age, the majority of effect sizes involved males (62%). Race was not indicated for half the effect sizes (50%). Almost two-thirds of effect sizes were associated with offenders considered at high risk to re-offend (59%). Risk designation was most commonly determined from the number of prior offences within the sample (61%). Among a minority of effect sizes, risk was calculated using a valid standardized psychometric (23%).

Within the incarceration vs. community domain, study design quality was rated as weak for a majority of effect sizes (62%). For almost two-thirds of the effect sizes length of follow-up was between one year and three years (65%). The distribution of type of outcome was evenly split among arrest (22%), conviction (32%), and incarceration (30%).

Effects on Recidivism

Spending more vs. less time in prison or being incarcerated vs. remaining in the community was associated with slight increases in recidivism for 3 of 4 outcomes. These results are detailed in Table 1 which can be read in the following manner. Beginning with the first row,

one sees that there were 222 comparisons of groups of offenders who spent more vs. less time in prison. Of these 222 comparisons, 190 recorded the approximate time in months spent in prison. The average length of incarceration for the "more" and "less" groups was 30.0 months vs. 12.9 months respectively (footnote a, Table 1).¹⁵ The total number of offenders involved in these comparisons was 68,248. The mean unweighted effect size was $\phi = .03$, equivalent to a 3% increase in recidivism (29% vs. 26%) for those offenders who spent more time in prison. The confidence interval (CI) was .03 to .05. When the effect sizes were weighted by sample size, the $z^{\pm}$ was the same (.03) and its CI was .02 to .04.

In the case of the incarceration vs. community comparison, the data showed a 7% increase in recidivism (49% vs. 42%)¹⁶ or a $\phi = .07$, for those offenders who were imprisoned. Upon weighting, the effect size became .00. The amount of time spent incarcerated could not be reliably determined (≈ 10.5 months) as only 19 of 103 comparisons reported this information.

Combining the results for the two types of sanctions in Table 1 produced a mean ϕ of .04 (CI = .03 to .06) and a $z^{\pm}$ of .02 (CI = .02 to .02).

Effects of Incarceration by Risk Level

The more vs. less results presented in Table 1 were sub-divided by risk categories.¹⁷ Of the more vs. less comparisons, 139 were designated as high risk and 78 as low risk. There was a tendency for the lower risk groups to show a greater increase in recidivism.

In the higher risk group, those who spent more time in prison had a higher recidivism rate (3%) than did their counterparts who spent less time in prison ($\phi = .03$, CI = .01 to .05). Once weighted, the $z^{\pm}$ was .02 with a CI = .01 to .03.

In the lower risk group, those who spent a longer time in prison had a higher (4%) recidivism rate than those who spent less time in prison ($\phi = .04$, $\text{CI} = .01$ to $.06$). Upon weighting, the z^* was $.05$ with a $\text{CI} = .04$ to $.06$.

In the incarceration vs. community comparison, 69 of the samples were classified as high risk and 25 as low risk. Differences in recidivism rate were virtually identical, whether measured in terms of ϕ or z^* , and were almost identical within each risk group or between high and low risk categories.

Correlation between Length of Time Difference Score and Recidivism by Risk Level

Another type of analysis of the risk issue was carried out in the following manner. First, the difference in the amount of time served in months was tabulated for each of the more vs. less comparison groups. Of the 190 effect sizes, 124 were classed as high risk and 66 as low risk. Then, within each of the high and low risk groups, the correlation between the amount of time served in months and recidivism was computed.

Table 2 shows that more time served was positively correlated with higher recidivism rates (ϕ) for the high risk group ($r = .22$) and the low risk ($r = .15$). The CIs of both groups, however, overlapped. When effect sizes were weighted by sample size, the relationship between time served and recidivism (z^*) was higher for the lower risk group ($r = .29$) than the higher risk ($r = .17$). Again, the CIs overlapped.

Other Comparisons

Length of incarceration was grouped into three levels: (a) Time 1 - less than 1 year, (b) Time 2 - more than 1 year and less than 2 years, and (c) Time 3 - more than 2 years. No evidence was found to support a U-shaped relationship between the three time periods and recidivism (Time 1 - % recidivism = 28.2, $\text{CI} = 24.5$ to 31.8 ; Time 2 - % recidivism = 26.8, $\text{CI} = 24.8$ to 28.8 ; and Time 3 - % recidivism = 24.1, $\text{CI} = 21.2$ to 26.9 , respectively). Note that the CIs for all three time periods overlapped considerably.

The relationship of selected study characteristics¹⁸ to ϕ was examined within each of the more vs. less and incarceration vs. community sanctions. In the case of the former, none were found to be related to effect size.

With respect to the latter, there were four significant comparisons. Mean effect sizes were significantly greater among studies whose quality of research design was rated as higher quality ($\phi = .11$, $CI = .09$ to $.14$) vs. lower quality ($\phi = .04$, $CI = .01$ to $.08$), indicating an increase in recidivism among offenders from well-designed studies. In addition, mean effect sizes were also higher among studies which determined offender risk using valid, psychometric protocols ($\phi = .14$, $CI = .10$ to $.18$) or where it was deduced from the control group's recidivism rate ($\phi = .12$, $CI = .05$ to $.18$) than those where risk level had to be decided on the basis of the presence or absence of a criminal history among the offenders ($\phi = .03$, $CI = .00$ to $.06$).

For this same group, effect sizes also differed by length of follow-up, such that those followed for 1 to 3 years had higher mean effect size ($\phi = .10$, $CI = .08$ to $.13$) than did either those followed for less than 1 year ($\phi = -.01$, $CI = -.05$ to $.03$) or those followed for more than 3 years ($\phi = .03$, $CI = -.03$ to $.08$). Mean ϕ values also differed by type of outcome. Both incarceration ($\phi = .13$, $CI = .09$ to $.16$) and court contact ($\phi = .17$, $CI = .03$ to $.31$) were associated with significantly higher mean effects than arrest ($\phi = .01$, $CI = -.02$ to $.04$).

Discussion

The data in this study represents the only quantitative assessment of the relationship between time spent in prison and offender recidivism. The database consisted of 325 comparisons involving 336,052 offenders. On the basis of the results, we can put forth one conclusion with a good deal of confidence. None of the analysis conducted produced any evidence that prison sentences reduce recidivism. Indeed, combining the data from the more vs. less and incarceration vs. community groupings resulted in 4% (ϕ) and 2% (z^2) increases in recidivism.

In addition, the results provided no support for three other hypotheses. The prediction that recidivism rates correlate with sentence length in a U-shaped fashion was not supported. The view that only lower risk offenders would be deterred by prison sentences was also not confirmed. The lower risk group who spent more time in prison had higher recidivism rates.

The hypothesis that "no frills" prisons would be better at punishing criminal behaviour was tested indirectly. The most consistently negative results came from the more versus less group, albeit, one should note that the majority of these effect sizes came from prison studies of ≈ 30 years ago, a time when prisons were noted for being barren, harsh environments ($\phi = .03$; $z^* = .03$ with neither CIs including 0).

Other results emanating from this research must be approached with considerably more caution because of the nature of the database. The studies reviewed contained precious little information on essential features. Descriptions of the offender samples were cursory and inconsistent (e.g., determinations of risk) across studies. Typical of other prison literatures (e.g., Gendreau et al., 1997), virtually nothing was known about the prisons themselves (i.e., how they were managed, existence of treatment programs, etc.) Many of the results from the more vs. less group came from studies of prison samples from the 1950 to 1970 era, when fewer amenities were prevalent, and from relatively few jurisdictions in one country, the U.S. Additional studies representative of this decade and other countries are urgently required.¹⁹ Therefore, we regard the trend in the findings that prisons are even modest schools of crime (i.e., marginally worse results for lower risk offenders in 3 of 4 statistical comparisons) as tentative.

Before addressing any policy implications forthcoming from the study some comments are in order about the equivalence of the comparison groups. It is often assumed that if a study does not have a true experimental design (i.e., random assignment) then the integrity of the results may somehow be diminished. In other words, non-random designs are presumed to report greatly inflated results. Recent meta-analyses encompassing $\approx 10,000$ treatment studies - including those conducted with offenders - found the magnitude of results is virtually identical

between randomized designs and those employing comparison group designs; it is only in the case of one design type - pre-post designs - that results are inflated (Andrews, Dowden, & Gendreau, 1999; Andrews, Zinger, Hoge, Bonta, Gendreau, & Cullen, 1990; Gendreau et al., in press; Lipsey & Wilson, 1993).

In this study pre-post designs were excluded. Only comparison group designs were included in the analysis after being categorized as to higher or lower quality. The higher quality group comparisons, in our view, were comprehensive given that the experimental and control groups did not differ on at least 5 important risk factors (i.e., criminal history, substance abuse, etc.), and, moreover, many of the comparisons were based on validated risk measures. Where some demographic differences between groups were reported, the results were statistically adjusted to account for these discrepancies. Interestingly, within the incarceration vs. community domain, the higher quality studies reported higher recidivism rates for the incarcerated group! There were no differences in effect size by design quality for the more vs. less category. Finally, two effect sizes came from randomized designs; they reported 5% and 9% increases in recidivism for the incarceration group.

What are the possible policy implications emanating from this study? There are, in our view, two viable recommendations. Prisons should not be used with the expectation of reducing future criminal activity. If further research supports the findings described herein, that time in prison increases offender recidivism by even "small" amounts, then the costs accruing from the excessive use of prison could be enormous. For example, even percentage changes of approximately 5% have resulted in significant cost implications in medicine and other areas of human services (Hunt, 1997). In the criminal justice field it is estimated that the criminal career of just one high-risk offender "costs" approximately \$1,000,000 (see Cohen, 1997). Arguably, increases in recidivism of even a "fractional" amount are not fiscally responsible, especially given the high incarceration rates currently in vogue in North America. One should also bear in mind that even the most enthusiastic proponents of the utility of sanctions are not only quite

sceptical about the use of prison but state, in no uncertain terms, that the deterrence literature in general is of limited use in formulating public crime control policy (Nagin, 1998).²⁰

Therefore, the primary justification for use of prisons is incapacitation and retribution, both of which come with a "price", if prisons are used injudiciously. Locking up chronic high risk offenders for a reasonable period of time is not under debate; we can think of no one who disagrees with that policy. In order to lock up enough prisoners, however, to reduce crime rates by a few percentage points (see Gendreau & Ross, 1981) and to make prisons "pay" for themselves (DiIulio & Piehl, 1991), substantial "costs" will accrue to other government ministries or departments. Unless an infinite source of funds becomes available to governments, fewer expenditures will be directed to education and health care, amongst other things. As a case in point, money spent by states to keep inmates incarcerated recently has risen by 30% while spending on higher education dropped by 19%, and costs to keep a child in school represent a quarter of that required to lock up an offender (Dobbin, 1999).

As for retribution, what appears to be a conceptually straightforward notion is, in fact, very complex. Walker (1991) has studied the justifications for retribution in considerable detail and has concluded that many retributive lines of reasoning are confounded by utilitarian objectives or run afoul of moral positions.²¹

Our second recommendation attests to the sad reality that so little is known about what goes on inside the "black box" of prisons and how this relates to recidivism (Bonta & Gendreau, 1990). Only a mere handful of studies have attempted to address this matter (Gendreau et al., 1979; Zamble & Porporino, 1990). Analogously, could one imagine so ubiquitous and costly a procedure in the medical or social services fields receiving such cursory research attention?

If a fuller appreciation of the effect of time in prison on recidivism is ever to be gained, then it is incumbent upon prison systems to do the following. They must continuously assess the situational factors that can mediate their institutional climates (i.e., inmate turnover, see Gendreau et al., 1997) and have a potentially negative impact on prisoners' adjustment and,

possibly, a long-term effect on recidivism. Appropriate measures are available for this purpose (e.g., Wright, 1985).

Secondly, it is necessary to conduct periodic assessments of prisoners (e.g., every six months to a year) on a wide variety of dynamic risk factors using valid risk protocols.²² While we await further confirmation, it is particularly important to closely monitor the progress of lower risk offender while incarcerated. This type of clinical information gathering will provide us with a much more sensitive and precise estimate of the effects of prison time than did the data available to us in this study. Only then will prison managers be able to empirically determine which offenders are more prone to recidivating upon release. With such knowledge in hand something truly constructive can be done (e.g., treatment, surveillance) to minimize risk to the public.

Footnotes

1. The opinions expressed are solely those of the authors. Preparation of this report was supported by contract #9914-GE/587 from the Solicitor General of Canada. We thank Mike Bradley, Murray Goddard and Travis Pitt for their assistance in the preparation of this document.
2. The recent evidence concerning the consequences of mandatory sentencing for the justice system has been alarming (see Caulkins, Rydell, Schwabe, & Chiesa, 1997; Crutchfield, Bridges, & Pitchford, 1994; Dobbin, 1999; Greider, 1998; Tonry, 1998; Wooldredge, 1996). Prison populations have tripled nationwide over the last 20 years and increased fivefold in the federal prison system alone. The U.S. Justice Department's budget has increased from \$4 to \$21 billion in 12 years. Courts are being clogged as defendants are more likely to insist on trial. Rand researchers' econometric analyses estimated that \$1,000,000 spent on mandatory sentences would result in a reduction in drug consumption (i.e., cocaine) of only 13 kilograms, while spending the same amount on treatment would see a corresponding reduction in drug consumption of 100 kilograms. Discretion has moved from the hands of judges to prosecutors with the latter being possibly less accountable. Across 90 federal jurisdictions that are responsible for administering mandatory sentencing policies, discrepancies in prison time meted out for similar offenses vary by a ratio of 10:1.

Some of the factors influencing the administration of mandatories in various localities are race, public fear of crime, media influences, type of drugs used, cultural values, prosecutorial caseloads, the use of informants, and idiosyncratic interpretation of the legal process. It is claimed that these inequities erode public trust in laws, moreover, hypocrisy flourishes as some prosecutors and judges "bend the rules" to avoid what are perceived as blatant injustices. Finally, the evidence to date indicates that mandatory sentences have had little effect on aggregate crime rates (Stolzenberg & D'Alessio, 1997).
3. Common sense definitions often run into difficulty because they cavalierly assume

something must be painful. In reality, some events, while not intuitively obviously aversive, may be effective punishers and vice-versa. Here is a fascinating "real world" example; on the basis of common sense, some U.K. prison authorities thought that they had designed a truly "punishing" regime, only to discover that the prisoners found some of the activities reinforcing (Thornton, Curran, Grayson, & Holloway, 1984)!

4. The survey data can be complex. The Doob et al., (1998) study found that the public showed some inconsistencies; while endorsing prison as an effective deterrent, over 70% opted for money not to be spent on prisons but on non-prison alternatives (e.g., prevention and rehabilitation). Cullen, Fisher, & Applegate (in press) have found considerable support for rehabilitation even within conservative areas in the U.S. Spelman (1995) and Wood and Grasmick (1999) reported that some offenders ($\approx 30\%$) would prefer a brief period of incarceration (one year or less) to extensive community sanctions.
5. Fabelo's (1995) data can be expressed in terms of a simple correlation between incarceration rates and crime rates. It is $r = -.41$.
6. An example of how aggregate data analysis tends to inflate results in the criminal justice field can be seen in Hsieh & Pugh's (1993) report that the correlation between two indices of social class and violent crime was $r = .44$, whereas, individual level data analyses report a much smaller relationship of $r = .07$ (Gendreau, Little, & Goggin, 1996).
7. "No-frills" is defined as no free coffee, visitors bringing food, restrictions on smoking, limiting the number of hot meals, recreational activities, television, telephone access, private property in cells, and having to wear clothing labelled "convict/chain gang" (Finn, 1996).
8. Bukstel & Kilmann were not inferring that all prisons have to function in this manner, and nor are we (see also Andrews & Bonta, 1998). It is reasonable to suggest, however, that the majority of staff in many prisons are not selected, trained, supervised and rewarded principally for their ability to develop and maintain pro-social attitudes and behaviour amongst inmates with the ultimate goal of reducing recidivism. Secondly, extremely few prisons have generated

evidence that they have been successful in rehabilitating offenders (see Gendreau, 1996 for references to those that have).

9. From Fishbein (1995) these steps are: the environment in which the offender lives has no chance of reinforcing the behaviour to be changed. The offender has a positive attitude towards performing the behaviour, believes the benefits outweigh the costs, and the behaviour is consistent with his self-image. Finally, not only should the offender believe he/she can perform the behaviour in a variety of life situations but actually has the skills to do so.

10. There are all kinds of interesting contradictions regarding offenders' thoughts about risk of apprehension which is not surprising given offenders' personality make-up. For example, in one survey, the majority of offenders claimed that prison was a deterrent while maintaining that they did not deserve to be punished and that society was definitely no safer with them in prison (Van Voorhis, et al. 1997). Risk of apprehension applies more to others or is simply dismissed (Claster, 1967; Wright & Decker, 1994). Offenders who are more likely to offend in the future had higher risk perceptions of being caught (Horney & Marshall, 1992). While 75% of young offenders did not know the penalties that applied to them, 90% felt they were well-informed and disagreed with the law anyway (Jaffe et al., 1984).

11. There have also been a few single studies that examined such a large number of comparisons (e.g., Gottfredson, Gottfredson, & Garofalo, 1977) that, without a quantitative assessment, it was impossible for the authors to precisely determine the direction and magnitude of the results.

12. The search did not include boot camp studies which are a form of specialised military "treatment" (Gendreau, Goggin, & Fulton, in press).

13. For a complete description of the methods, statistics and a list of studies employed in the meta-analysis please contact the first author at gendreau@unbsj.ca or by faxing 506-648-5780.

14. Some studies report several effect sizes by comparing differing lengths of prison terms.

For example, a study could report recidivism rates for offenders serving 1, 3, or 5 years, thereby offering the comparison of any of the inherent combinations, for a total of three effect sizes (i.e., 1 vs. 3, 1 vs. 5, etc.).

15. These figures are approximate. They represent an underestimation in the "more" category as studies sometimes reported sentences at the upper end as 24 months+, with no limit to the upper end. At the lower end studies reported the range of time served within limits (e.g., 6 - 12 months) which we scored at the midpoint.

16. The recidivism rates were higher for this category because the studies in this data set reported longer follow-up periods. Most of the more vs. less effect sizes were associated with short follow-up periods of 6 months to 1 year.

17. Offender risk designation was determined on the basis of the studies having reported prior record among the offender samples, a low risk designation equating with no priors. In the absence of any description of prior record in the original studies, the authors used one of the following criteria to designate risk: the level of risk based on the results of a valid risk measure as reported in the study, or the recidivism rates of the comparison group were used to determine risk (low risk = a recidivism rate of 15% in the first year of follow-up or 30% during a follow-up of two years or more).

18. Study characteristics whose frequency distributions were not skewed (i.e., no value > 60% of the distribution) were selected for further analysis. These included study decade, offender age, offender risk level, risk assessment methodology, quality of research design, type of control group, length of follow-up, and type of outcome.

19. Why there are so few current studies that correlate length of incarceration with recidivism of offenders of similar risk level is puzzling. There has to be a wealth of data which could address this issue in today's prisons.

20. Assume for a moment that future research finds some offenders to be deterred by

longer prison sentences or a brief period of incarceration. Psychological theory predicts they would be those offenders who were more introverted, less psychopathic, etc., in other words, those of lower risk (Andrews & Bonta, 1998, p. 171-173). Can one imagine a justice system, operating under the principles of fairness, invoking a utilitarian policy that meted out more severe sentences to lower risk offenders even though they may have committed crimes of similar nature and severity as their higher risk counterparts?

21. Walker (1991) contends (p. 139) that the most logically consistent argument retributivists can assert is the right to have retributive feelings.

22. For a list of some of the most useful risk measures see Gendreau, Goggin, and Paparozzi (1996). It is known that changes in offender risk level are predictive of meaningful shifts in recidivism (i.e., $\approx 30\%-40\%$) (Gendreau et al., 1996, p. 586).

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Table 1

Mean ϕ (ϕ) and mean weighted ϕ ($\bar{\phi}$) for More vs. Less and Incarceration vs. Community sanctions

Type of Sanction (k)	N	$M\phi(SD)$	$CI\phi$	$\bar{z}^{\dagger}$	$CI_{\bar{z}}$
1. More vs. Less (222) ^a	68,248	.03(.11)	.02 to .05	.03	.02 to .04
2. Incarceration vs. Community(103) ^b	267,804	.07(.12)	.05 to .09	.00	.00 to .00
3. Total (325)	336,052	.04(.12)	.03 to .06	.02	.02 to .02

Note. k = number of effect sizes per type of sanction; N = total sample size per type of sanction; $M\phi(SD)$ = mean ϕ and standard deviation of per type of sanction; CI_{ϕ} = confidence interval about $M\phi$; $\bar{z}^{\dagger}$ = weighted estimation of ϕ per type of sanction; $CI_{\bar{z}}$ = confidence interval about $\bar{z}^{\dagger}$.

^a More vs. Less - mean prison time in months ($k = 190$) : More = 30.0 mths, Less = 12.9 mths, Difference = 17.2 mths.

^b Incarceration vs. Community - mean prison time in months ($k = 19$): 10.5mths.

Table 2

Correlation between Length of Prison Time Difference Score and Effect Size by Risk Classification

(k)	N	Difference	r_1	CI_1	r_2	CI_2
Incarceration: More vs. Less						
1. High Risk (124)	44,415	17.3	.22	.05 to .39	.17	.00 to .34
2. Low Risk (66)	20,919	16.9	.15	-.09 to .39	.29	.07 to .51
3. Total (190)	68,248	17.2	.20	.06 to .34	.21	.07 to .35

Note. Difference = Mean difference in length of time served in months between the "More" and "Less" groups; r_1 = correlation between the mean Length of Prison Time Difference score and ϕ ; CI_1 = confidence interval about r_1 ; r_2 = correlation between the mean Length of Prison Time Difference score and $\bar{z}$; CI_2 = confidence interval about r_2 .